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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/241,851 | 02/02/1999 | TAKEHIKO NAKAI | 865.4335 | 9228 |

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

CHANG, AUDREY Y

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2872

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/241,851

Applicant(s)

NAKAI, TAKEHIKO

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,9 and 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,9 and 11-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on July 10, 2003, which has been entered as paper number 31.
- By this amendment, the applicant has amended claims 1, 2, 4, 5, 9, 11, 12, 18, 19, 20 and 22.
- Claims 1-2, 4-5, 9, 11, 12, and 13-22 remain pending in this application.
- The rejections to claims 18 and 19 under 35 USC 112, second paragraph, set forth in the previous Office Action are withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 11, 12, 13-17 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ishii (PN. 6,157, 488) in view of the patent issued to Gerritsen et al (PN. 5,048,925).

The reasons for rejections are set forth in the previous Office Action dated March 10, 2003.

Claims 1, 11, 12, 20 and 22 have been amendment to include the feature having the maximum optical path length difference occurring in the diffractive grating portion. This feature is implicitly included in the cited Ishii reference since the optical length difference is the key feature for the optical diffractive element to have diffraction properties. The maximum optical path length difference is defined as the difference between the optical path passes through the top part of one of the grating in the

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diffractive optical element and the optical path passes through the bottom part of the same grating such that the paths pass through different combinations of the regions with different diffractive indices, as shown in the Figures of Ishii. With regard to claim 11, when the maximum optical path length difference is an *integer multiple* of the wavelength of the light passes through the diffractive optical element, it will constructively diffract the light with the integer identified as the order of diffraction.

3. **Claims 2, 4, 5, 9, and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Ishii and Gerritsen et al in view of the patent issued to Sakai et al.**

The reasons for rejection are set forth in the previous Office Action dated March 10, 2003.

Claims 2, 4, 5, and 9 have been amendment to include the feature having the maximum optical path length difference occurring in the diffractive grating portion. This feature is implicitly included in the *cited Ishii* reference since the optical path length difference is the key feature for the optical diffractive element to have diffraction properties. The maximum optical path length difference is defined as the difference between the optical path passes through the top part of one of the grating in the diffractive optical element and the optical path passes through the bottom part of the same grating such that the paths pass through different combinations of the regions with different diffractive indices, as shown in the Figures of Ishii.

Claims 18 and 19 have been amended to include the feature "portions forming the chamfered shape are each formed as a flat surface (claim 18) or a curved surface (claim 19)". Sakai et al reference teaches explicitly that the region forming the chamfered shape is each formed with a flat surface (M) and a curved surface (20, Figure 3a).

Double Patenting

4. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894);

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In re Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

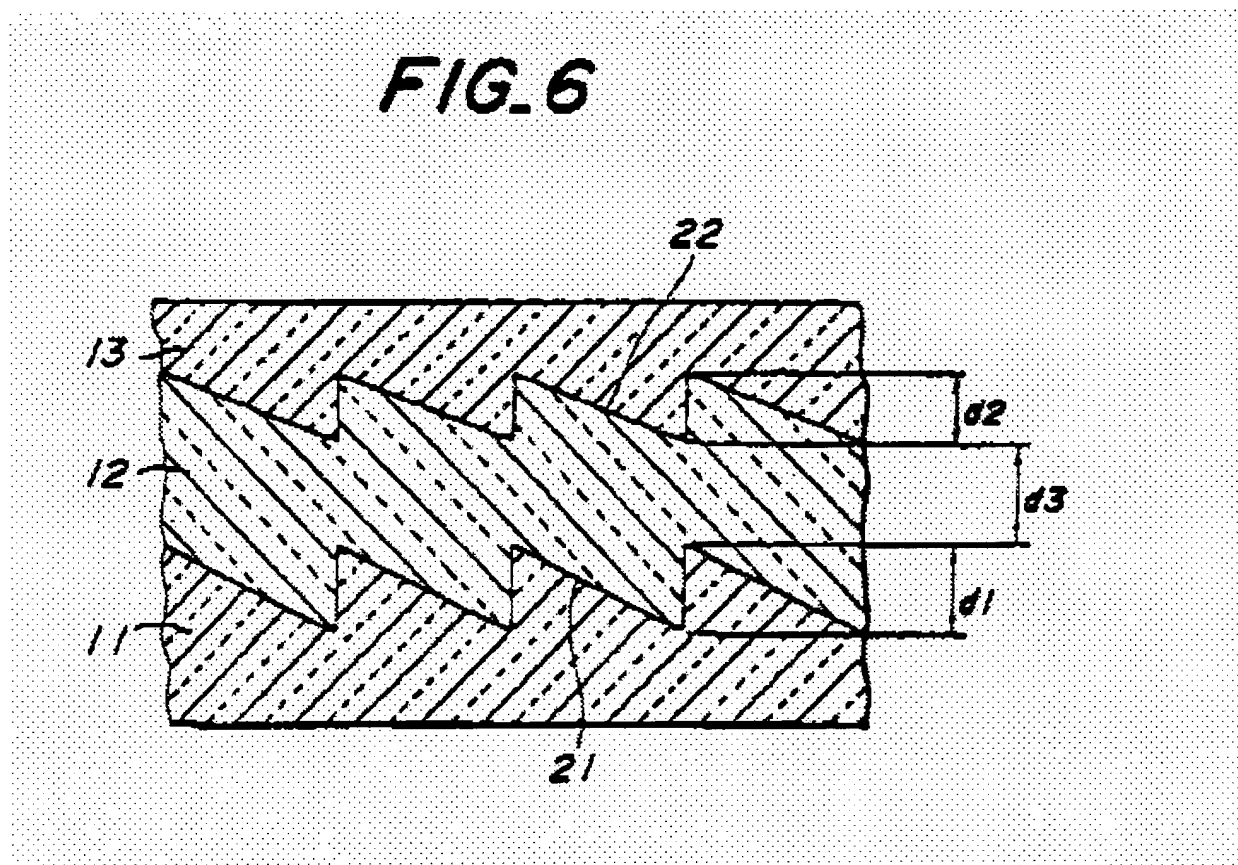
5. Applicant is advised that should claim 1 be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). **Claims 1 and 11 are essentially the same.** The feature “said optical element is for diffraction light of a specific order” recited in claim 11 **does not** differentiates it from claim 1 since the condition for the maximum optical path length difference “is m (integer) times the wavelength” (as recited in claim 1) is the same thing as saying the optical element diffracts the light having the wavelength at an diffraction order m.

Response to Arguments

6. Applicant's arguments filed on July 10, 2003 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

7. In response to applicant's arguments, which state that the cited Ishii reference fails to suggest the novel and useful configuration of the present invention as a whole, the examiner respectfully disagrees for the reasons, stated below. Ishii reference teaches specifically a diffractive optical element having a pair of diffractive gratings wherein said pair of diffractive grating has differing dispersion from each other. Ishii et al teaches that the diffractive optical element has the configuration as shown in Figures 6-7 and other figures in the reference.

Using Figure 6 as demonstration, with the refractive indices for the optical regions (13, 12 and 11) to be designated as (n_1 , n_2 , n_3 respectively) and the grating height to be d_2 and d_1):



The maximum optical path length difference is defined as follows:

$$(n_1 - n_2) * d_2 + (n_2 - n_3) * d_1 \quad (\text{based on fundamental physics theory}).$$

In order for the diffractive optical element to be able to diffract light of wavelength λ the maximum path length difference is an integer multiple of the wavelength, that is

$$(n_1 - n_2) * d_2 + (n_2 - n_3) * d_1 = m * \lambda$$

This equation (which is based on the fundamental theory of diffraction) is therefore the essential equation and condition for designing a diffractive optical element having a pair of diffractive gratings. Such equation is well known to one skilled in the art. The only things left for one skilled in the art to design a diffractive optical element having a pair diffractive gratings are *selecting* the desired optical

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materials with desired refractive indices and desired grating height (d_2 and d_1). Such **selections of materials and selections of grating height** constitute **no novelty**. Since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Also it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

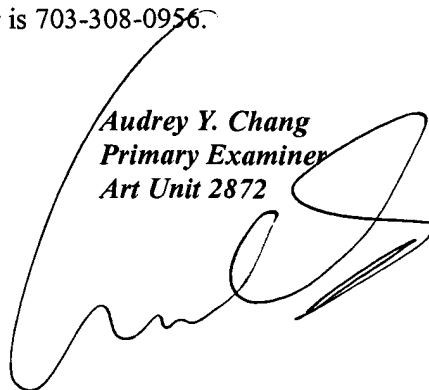
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
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A. Chang, Ph.D.

A handwritten signature in black ink, appearing to be 'Audrey Y. Chang', written over the printed name and title.